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Russell Thackston
Georgia Southern University, rthackston@georgiasouthern.edu

Chris Kadlec
Georgia Southern University, ckadlec@georgiasouthern.edu

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TRANSFORMING A LAN PARTY INTO A CLASSROOM

Russell Thackston
Georgia Southern University
rthackston@georgiasouthern.edu

Chris Kadlec
Georgia Southern University
ckadlec@georgiasouthern.edu

ABSTRACT

Twice each semester the second floor of Georgia Southern University's IT Building transforms from classrooms and computer labs into the university's largest student gaming event. Georgia Southern University's chapter of the Association of Information Technology Professionals (AITP) -- under the close supervision of IT faculty -- hosts the LAN party-style event with an open invitation to the entire student body to come play games, enjoy pizza and Monster drinks, and socialize with other gamers. With over thirty-five of these events under their belt, the faculty have found unique ways to spark learning and generate teachable moments with the students throughout the event. This manuscript outlines many of the techniques used to prompt teachable moments to help other faculty design and improve their own non-traditional instruction methods. Future research will focus on quantitative measurements of the impact of teachable moments on student learning.

Keywords

Teachable moments, pedagogy, information technology, networking

BACKGROUND

Twice each semester Georgia Southern University's student chapter of the Association of Information Technology Professionals (AITP) hosts a student gaming event known as TekLAN. For the LAN party-style gaming event, students transform the second floor of the IT Building from classrooms and computer labs into a giant pizza party with video games, board games, console games, and social events. One major element of TekLAN involves transforming seventy classroom computers into gaming PCs, including the Steam platform with various popular games pre-installed. While AITP students drive the process, IT faculty who volunteer their time for the after-hours event to monitor and advise closely supervises it.

TEACHABLE MOMENTS

Although no single, authoritative definition exists for a teachable moment, many researchers have outlined the concept from a variety of perspectives. One perspective describes a teachable moment as "one in which the student arrives at a position where he or she is open to teaching." (Elmborg, 2002) Another perspective describes the teacher's role in a teachable moment as "to observe [the learner's] natural unfolding and provide activities that will enable them to learn what they are ready to learn when they are ready to learn it." (Hyun and Marshall, 2003) With over thirty-five of these events under their belt, the IT faculty have devised a variety of opportunities to initiate teachable moments with the students without making it obvious that the student is being taught.

TEKLAN

These opportunities coincide with the main phases of the TekLAN event: lab setup and teardown, as well as the event itself. Prior to the start of the event, student volunteers perform many of the setup tasks manually. These setup and teardown tasks include moving large files to lab computers, changing the system configuration, hardening the systems to prevent accidental or malicious tampering, troubleshooting of problems, etc. Although many of these tasks could be automated and managed by IT Services, the use of manual processes provides multiple teachable moments for student volunteers. During the TekLAN event itself, the students are presented with multiple teachable moments for their soft skills: time management, conflict resolution, teamwork, customer service, etc. These teachable moments tend to be unplanned and faculty must be prepared to take advantage of whatever opportunities present themselves.

Technical Skills

The TekLAN event converts one of the largest computing labs on campus into a gaming lab by replacing the standard operating system with a customized, gaming-oriented Windows 10 installation. Once the event is over, however, the computers must be quickly converted back to a normal state for classroom use. This process involves (1) copying a 160GB virtual hard disk image onto each of the lab computers, (2) modifying the boot sequence to automatically boot from the gaming image, and (3) locking down the system configuration to prevent modification. In lieu of automated processes, student volunteers manually perform the changes. Using a manual process demonstrates the inner-workings of the effort and allows for extensive, casual student-teacher interaction, due to the length of the process.

Distributing Large Files

The TekLAN setup uses a UDP broadcast to distribute the files. UDPCast is the product currently being used with the sender coming from a Linux version going to a Windows version of the receiver. The sender is booted from a thumb drive onto a private internal LAN. Students are instructed how to navigate through the command line to start the receiving of the file which entails disabling some virtual network cards, opening firewalls, deleting old files and running complex commands.

Since copying a 160GB file to seventy computers is a time-consuming process, by any measure, the student volunteers have ample time to discuss the process with faculty, including UDP, Linux, alternative solutions, troubleshooting, and the factors involved with using a closed lab environment versus an open network.

Boot Sequence

Once the gaming image has been copied to the lab computers, each computer must be modified to add the new image as a boot option. Additionally, the gaming image must be set as the default, in case a computer gets rebooted during TekLAN. This modification requires editing the system configuration with tools such as msconfig and bcdedit, both Windows specific tools.

Having the student manually edit these setting provides an opportunity for the students to use tools they would not normally access in their daily lives. It also opens a student-faculty dialog on operating systems, boot managers, virtual hard drives, and performance considerations.

Command Line Interface (CLI)

Like much of IT work in the enterprise, several TekLAN modifications require the use of one or more command line tools, such as udp-receive, copy, and rename. Although most consumer activities involve point/click/swipe/tap actions, many enterprise management tools require knowledge of the command line interface. By forcing student volunteers to use the CLI, the faculty have an opportunity to discuss common features of the CLI, how the CLI can be faster than a point-and-click interface, and ways in which the CLI can help with automation.

Using VHDs for performance

Virtualization is a common solution to the problem of temporarily running a different guest operating system on a host computer. However, virtualized computers lack the necessary video performance to play modern PC games, such as Call of Duty: Modern Warfare. Therefore, the TekLAN event uses a virtual hard disk (VHD), coupled with a native installation of Windows 10, to temporarily switch operating systems without sacrificing performance. The installation of the VHD requires a few manual steps that the student volunteers perform using the CLI. During this step the students typically ask questions about the process, opening the door for a discussion on VHDs, virtualization, and performance.

Configuration management

The building of the gaming image is left to student groups and their volunteers who typically work for the computer support group on our campus. The oversight by the computer support department is critical since the lab is primarily for instructional purposes and they maintain that configuration. The emphasis of the primary purpose of the computer labs is conveyed to all the students but this second purpose of a gaming night allows them to "take ownership" of the lab. Configuration management is a significant role of computer support groups (Hochstein, Zarnekow & Brenner, 2005) and this interaction with computer support with the event emphasizes to all how important a role it is.

System hardening

The primary IT computing labs that are used for TekLAN use a software system called Deep Freeze. Deep Freeze allows students to have administrator rights and make nearly any change to the operating system, which are then wiped out the next time the computer is rebooted. Naturally, any gaming event will result in a few computer restarts, so the TekLAN image must be made persistent, outside of Deep Freeze. This requires "thawing" the computers, having the student volunteers made multiple, manual changes to the systems, and then refreezing the computers. Typically, the explanation of the thaw-modify-freeze process prompts questions about the inner working of the software, admin rights, and the boot process. This presents additional instances of teachable moments which faculty use to guide a conversation.

Operating systems

Most computer games -- outside of consoles such as the Xbox One and PS4 -- are designed to only run under Windows. During TekLAN, an iMac is typically set up in the gaming room running a PC-only game. Inevitably, one or more students will stop by to ask how a PC-only game can be run on an Apple computer. This presents a uniquely teachable moment: the students have initiated the conversation by asking for knowledge. Although the answer is very basic -- the iMac has a

bootloader that allows the computer to boot the Windows operating system -- the discussion inevitably pivots to "Mac versus PC." This allows the faculty member to observe and guide an exchange of ideas including form factors, technical support models, price, performance, usability, etc.

Soft Skills

AITP students take a primary role in planning and managing the TekLAN event, under the guidance of the AITP faculty advisor. The role of the advisor is to allow the students to success or fail, while maintaining the integrity and reputation of the university. Consequently, many opportunities present themselves to guide the growth of the AITP student leaders, not by jumping in and taking over, but by asking pointed and guiding questions when teachable moments present themselves.

Teachable moments for soft skills are much more difficult to instigate. Therefore, faculty must on the lookout for those moments that present themselves. For example, when a student asks How many volunteers do you think we need for the concessions stand? A constructive response would be to ask the student to describe the pertinent details about the concession stand: hours of operation, job roles, location, etc. This leads the student to consider not only the answer to their original question, but what factors might influence the answer.

FUTURE RESEARCH

Teachable moments are useful for improving student engagement within specific instances, such as during lab setup. Future research will focus on quantitative measurements of the long-term impact of teachable moments, both inside and outside the classroom. Such metrics might include impact to student engagement, depth of knowledge, and information retention.

CONCLUSION

From a student perspective, the TekLAN event is a time to relax, play games, eat pizza, and drink massive quantities of caffeine. From a faculty perspective, TekLAN is a unique opportunity to engage students in teachable moments when they are most open to learning something new. The key to exploiting these teachable moments lies in a simple formula. First, deliberately set up scenarios that engage student interest and spark obvious questions. Second, answer the students' questions, but extend the conversation further by asking the students for their thoughts and listening to their comments.

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